

## CLAIMS

We claim:

- [0041] 1. An Ion mobility spectrometer comprising a reaction zone, a drift zone and an ion detector, comprising, as ionization element, a corona discharge source (200; 300) comprising:
- 5 [0042] – a first chamber (201; 308) provided with an inlet (210; 309) for a gas to be analyzed and with at least one first opening for communication (203; 311) between the internal space defined by said first chamber and the reaction zone of an IMS spectrometer;
- [0043] – a second chamber (204; 303), contained in said first chamber, provided with an inlet (209; 306) for an ultra-pure gas or a mixture of ultra-pure gases, and with at least one second
- 10 communication opening (206; 310, 310') between said first and second chambers; and
- [0044] – a pair of electrodes (207, 208; 304, 302'), at least one of which (207; 304) is needle-shaped, arranged in said second chamber;
- [0045] said pair of electrodes and second opening being arranged in such geometrical relationship that there is no optical path between the zone of the corona discharge and the ion
- 15 detector of the IMS instrument.
- [0046] 2. The Ion mobility spectrometer according to claim 1, further comprising an electronic circuit allowing maintenance of a constant potential difference between said pair of electrodes.
- [0047] 3. The Ion mobility spectrometer according to claim 1, further comprising an electronic circuit allowing maintenance of a constant current between said pair of electrodes.